

REMARKS

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, claims 3 and 13 have been canceled, and the subject matter of such canceled claims has been incorporated into claims 1 and 11, respectively. Claim 1 has been further amended to recite that the particles having an average particle diameter are substantially monodisperse, and have a particle size that is different from a particle size of the coarse particles. Support for such amendment can be found in the instant specification at least at page 3, lines 15-18, taken in connection with the paragraph bridging pages 24 and 25.

In the Official Action, claims 1-10, 21 and 22 stand rejected under 35 U.S.C. §112, second paragraph, for reciting the word "coarse". As explained at page 3 of Applicant's disclosure, the term "coarse particles" refers to particles which have a particle size that deviates from the average particle size. In an effort to expedite prosecution, and without addressing the propriety of the Examiner's assertions concerning indefiniteness, it is noted that claim 1 has been amended to recite that the particles having an average particle diameter are substantially monodisperse, and have a particle size that is different from a particle size of the coarse particles. Thus, it is clear from such amendment that the coarse particles can be distinguished from the substantially monodisperse particles based on particle size. Accordingly, for at least the above reasons, withdrawal of the §112, second paragraph, rejection is respectfully requested.

Claims 1-4, 6-8, 10-14, 16-18 and 20-24 have been rejected under 35 U.S.C. §102(a) as being anticipated by International Publication No. WO 03/034104 (*WO '104*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

The present application claims the benefit of foreign priority of Japanese Patent Application Nos. 2002-340913 and 2002-341186, each of which was filed on November 25, 2002. It is noted that verified English translations of such priority applications will be filed in the Patent Office in the near future. Applicant submits that each of the pending claims of the present application is supported by at least one of the '913 and '186 priority applications. The November 25, 2002 priority date is prior to the April 24, 2003 publication date of *WO '104*. Accordingly, upon perfecting the foreign priority claim, *WO '104* is removed from qualifying as §102(a) prior art with respect to the present application.

Furthermore, it is well established that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). For an anticipation to exist, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In the present case, *WO '104* fails to disclose each feature recited in independent claims 1 and 11, and as such fails to constitute an anticipation of such claims. For example, *WO '104* does not disclose particles having an average particle diameter which are substantially monodisperse, in combination with other aspects recited in claim 1. Further, *WO '104* does not disclose that the particle in the

hard coat layer satisfies a relationship represented by the formula (1): $0 \mu\text{m} \leq d_{\text{Max}} - d_{\text{AC}} \leq 7 \mu\text{m}$, as recited in claim 11.

It is noted that the Patent Office has relied on Example 5 disclosed at page 56 of *WO '104*, for the use of beads having a particle size of $3.0 \mu\text{m}$. *WO '104* specifies that the beads used in such examples are MX300 beads obtained from Soken Chemical & Engineering Co., Ltd. See Official Action at page 3. Respectfully, Applicant notes that one of ordinary skill in the art would have recognized that while *WO '104* discloses a particle size of $3.0 \mu\text{m}$, the MX300 beads are not substantially monodisperse, but rather have a comparatively broad particle size distribution. In this regard, the Examiner's attention is directed to the attached excerpts of U.S. Patent Nos. 6,074,741 and 6,261,665, which disclose that the MX300 beads available from Soken Chemical & Engineering Co., Ltd. have a particle size of $3.0 \mu\text{m} \pm 0.5 \mu\text{m}$. See Example 2 of the '741 patent and Comparative Example 6 of the '665 patent. Furthermore, the '741 patent discloses that the MX300 beads contain 99 wt. % of particles having a particle size ranging from 0.5 to $6.0 \mu\text{m}$ and less than 1 wt. % of particles having a particle size greater than $6.0 \mu\text{m}$. Quite clearly, in view of such disclosures of the '741 and '665 patents, the skilled artisan would have recognized that the MX300 beads are not substantially monodisperse. Further, it is **far from certain** in light of the disclosures that the MX300 beads satisfy the relationship represented by the formula (1) recited in claim 11.¹

¹ The Patent Office's burden of proof for properly alleging an inherent disclosure is well established. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities.'" *In re Robertson*, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (emphasis added).

The Official Action at pages 5-6 notes that *WO '104* at page 13, lines 4-5, discloses that the transparent fine particles may be mono-dispersed organic or inorganic particles. However, as discussed above, the Patent Office has relied on the MX300 beads available from Soken Chemical & Engineering Co., Ltd. and the example employing such beads. As previously noted, it is far from certain that the MX300 beads are monodisperse. Quite to the contrary, the above cited patent literature discloses that the MX300 beads have a comparatively broad particle size distribution.

For at least the above reasons, it is apparent that independent claims 1 and 11 are not anticipated by *WO '104*. Accordingly, withdrawal of the §102 rejection is respectfully requested.

Claims 5 and 15 stand rejected under 35 U.S.C. §103(a) as being obvious over *WO '104* and further in view of a JPO website machine translation of Japanese Patent Document No. 10-268111. Claims 9 and 19 stand rejected under 35 U.S.C. §103(a) as being obvious over *WO '104*, and further in view of U.S. Patent No. 6,535,195 (*Nelson*). Claims 1, 2, 4-8, 10-12, 14-18 and 20-24 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent Application Publication No. 2002/0060849 (*Matsunaga et al '849*) in view of U.S. Patent Application Publication No. 2002/0142133 (*Matsunaga et al '133*). Claims 9 and 19 stand rejected under 35 U.S.C. §103(a) as being obvious over *Matsunaga et al '849* in view of *Matsunaga et al '133*, and further in view of *Nelson*.

Without addressing the propriety of the Examiner's comments concerning the above rejections, it is noted that such rejections are moot in view of the above amendments, in which the subject matter of claims 3 and 13 has been incorporated

into independent claims 1 and 11, respectively. In this regard, claims 3 and 13 have not been listed in any of the above rejections. Accordingly, for at least the above reasons, withdrawal of the rejections is respectfully requested.

Claims 3 and 13 stand rejected under 35 U.S.C. §103(a) as being obvious over *Matsunaga et al* '849 in view of *Matsunaga et al* '133, and further in view of U.S. Patent No. 6,945,656 (*Takahashi et al*). As discussed above, claims 3 and 13 have been canceled, and the subject matter thereof has been incorporated into independent claims 1 and 11, respectively. It is noted that upon perfecting the foreign priority claim to the '913 and '186 Japanese priority applications by submission of verified English translations thereof, *Takahashi et al* is removed from qualifying as §102(e) prior art with respect to the present application.² The November 25, 2002 foreign priority date is prior to the December 17, 2002 §102(e) date of *Takahashi et al*. Upon the removal of *Takahashi et al* from qualifying as prior art under §102(a) or (e), it is apparent that the above §103(a) rejection is untenable, and withdrawal of such rejection is respectfully requested.

Submitted herewith for the Examiner's consideration is a Statement Under 35 U.S.C. §103(c) with respect to *Ito et al*.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited.

² It is also noted that US 2003/0112520 which corresponds to *Takahashi et al*, was published on June 19, 2003, i.e., not more than one year prior to the November 20, 2003 international filing date of International Application No. PCT/JP03/14843 upon which the present §371 application is based. Thus, the '520 publication does not constitute §102(b) prior art. Further, since the '520 publication was published after the November 25, 2002 foreign priority date, the publication does not qualify as §102(a) prior art.

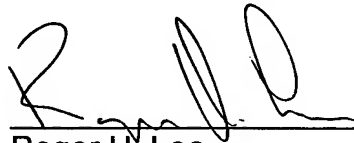
If there are any questions concerning this paper or the application in general,
the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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from the ultraviolet curing resin containing at least the epoxy compound and the photo-cationic polymerization initiator, and the beads of resin having the predetermined particle size distribution is provided on one or both sides of the transparent substrate and has the predetermined HAZE value, and so exhibits good glare-reduction and can develop vivid and high-definition image contrast free of any glittering when used in image displays such as CRT and LCD. Further, the polarizing film produced by using the antiglare material according to the present invention has good glare-reducing effect, exhibits excellent image contrast free of any glittering and is hence useful for image displays such as liquid crystal panels.

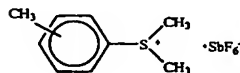
EXAMPLES

The present invention will hereinafter be described specifically by the following Examples. Incidentally, all designations of "part" or "parts" as will be used in the following Examples mean part of parts by weight unless expressly noted.

Example 1

A dispersion of the following composition obtained by dispersing a mixture of beads of a crosslinked acrylic resin and toluene for 30 minutes in a sand mill, and a base coating formulation of the following composition were first stirred and mixed with each other for 15 minutes in a disperser, thereby obtaining a coating fluid. This coating fluid was coated on one side of a transparent substrate formed of triacetyl cellulose and having a thickness of 80 μm and a transparency of 92% by a reverse-roll coating method and dried at 100° C. for 2 minutes. The thus-obtained dry film was then subjected to ultraviolet-light irradiation by means of a condenser-type high pressure mercury lamp of 120 W/cm under conditions of irradiation distance (distance between the center of the lamp and the surface of the coating film) of 10 cm and a treating rate (rate of the coated substrate to the mercury lamp) of 5 m/min, thereby curing the coating film. In this manner, an antiglare material having a roughened surface layer 2.5 μm thick and a HAZE value of 16.5 was obtained.

[Composition of the dispersion]	
Crosslinked acrylic resin beads [TRADE name: MX150 (Crosslinked polymethyl methacrylate); particle size: 1.5 \pm 0.5 μm ; product of Soken Chemical & Engineering Co., Ltd.; containing 99 wt. % of particles having a particle size ranging from 0.5 to 6.0 μm and less than 1 wt. % of particles having a particle size greater than 6.0 μm]	9 parts
Toluene	210 parts
[Composition of the base coating formulation]	
Acrylic compound (Dipentaerythritol triacrylate)	45 parts
Epoxy compound (Trade name: Celloxide 2021; product of Daicel Chemical Industries, Ltd.)	45 parts
Photo-cationic polymerization initiator	2 parts
Isopropyl alcohol	5 parts



Example 2

An antiglare material having a roughened surface layer 3.6 μm thick and a HAZE value of 22.0 was obtained in the

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same manner as in Example 1 except that the roughened surface layer was formed with the following dispersion and base coating formulation.

[Composition of the dispersion]	
Crosslinked acrylic resin beads [Trade name: MX300 (crosslinked polymethyl methacrylate); particle size: 3.0 \pm 0.5 μm ; product of Soken Chemical & Engineering Co., Ltd.; containing 99 wt. % of particles having a particle size ranging from 0.5 to 6.0 μm and less than 1 wt. % of particles having a particle size greater than 6.0 μm]	14 parts
Toluene	205 parts
[Composition of the base coating formulation]	
Acrylic compound (Tripenaerythritol polyacrylate)	45 parts
Epoxy compound (Trade name: Cyacure UVR-6110; product of Union Carbide Corp.)	45 parts
Photo-cationic polymerization initiator (Trade name: Cyacure UVI-6990; product of Union Carbide Corp.)	2 parts
Isopropyl alcohol	5 parts

Example 3

An antiglare material having a roughened surface layer 3.8 μm thick and a HAZE value of 13.0 was obtained in the same manner as in Example 1 except that the roughened surface layer was formed with the following dispersion and base coating formulation.

[Composition of the dispersion]	
Crosslinked acrylic resin beads [Trade name: MX150; particle size: 1.5 \pm 0.5 μm ; product of Soken Chemical & Engineering Co., Ltd.; 5 parts]	10 parts
Crosslinked acrylic resin beads [Trade name: MX300; particle size: 3.0 \pm 0.5 μm ; product of Soken Chemical & Engineering Co., Ltd.; 5 parts]	5 parts
Toluene	210 parts
[Composition of the base coating formulation]	
Acrylic compound (Tetraerythritol triacrylate: 15 parts) (Neopentyl glycol diacrylate: 30 parts)	45 parts
Epoxy compound (Trade name: Epikote 828; product of Yuka Shell Epoxy Kabushikikaisha)	45 parts
Photo-cationic polymerization initiator (Trade name: Cyacure UVI-6990; product of Union Carbide Corp.)	2 parts
Isopropyl alcohol	5 parts

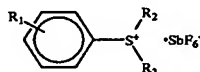
Example 4

An antiglare material having a roughened surface layer 3.8 μm thick and a HAZE value of 9.0 was obtained in the same manner as in Example 1 except that the roughened surface layer was formed with the following dispersion and base coating formulation.

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-continued

Trimethylolpropane triacrylate 42 parts
 Photo-cationic polymerization initiator represented by the following formula: 10 parts



Isopropyl alcohol 5 parts

Comparative Example 6

A comparative anti-reflection material having a surface-roughened layer with a thickness of 3.0 μm and a refractive index of 1.53 was obtained in a manner similar to that of Example 9, with the exception that the composition of the surface-roughened layer was replaced with the following composition. The critical surface tension of the surface layer was 40 dyne/cm. The comparative anti-reflection material had a HAZE value of 13 and a reflectance of 1.4%

[Composition of the dispersion liquid]

Crosslinking acrylic beads 2 parts
 (Trade name: MX300, particle size 3.0 $\mu\text{m} \pm 0.5$ produced by Soken Chemical & Engineering Co., Ltd.)

Toluene 100 parts

[Composition of the base coating material]

Polyester-type thermoplastic resin 40 parts
 (Trade name: Nylon 200, produced by Toyobo Corporation)

Toluene 70 part

MEK 100 parts

The polarizing film (20) having a construction shown in FIG. 2 was produced using one of the anti-reflection materials (10) and comparative anti-reflection materials (10). Subsequently, the polarizing film (20) was adhered to the glass substrate (33) as shown in FIG. 3 to produce a liquid crystal display (30). In addition, with regard to the anti-reflection material (10) obtained in Example 6, a laminate wherein the PET surface is adhered to the polarizing film on which a surface-roughening treatment was not carried out, via an adhesion agent was prepared, and the thus obtained laminate was adhered to the glass substrate (43), as shown in FIG. 4, to obtain a liquid crystal display (40).

In addition, with regard to the anti-reflection material (10) obtained in Example 12 and the comparative anti-reflection material (10) obtained in Comparative Example 2, a laminate wherein the surface of the saponified TAC is adhered to the polarizing film, on which a surface-roughening treatment was not carried out, via an adhesion agent was prepared, and the thus obtained laminate was adhered to the glass substrate (43), as shown in FIG. 4, to obtain a liquid crystal display (40).

In addition, a laminate was produced in the same manner as described in Example 9 with the exception that a non-saponified TAC was coated on a polarization substrate made of PVA, a surface-roughened layer having the same composition as described in Example 9 was coated thereon, and subsequently the TAC was saponified by means of an alkaline treatment. Subsequently, a liquid crystal display (40) was prepared in the same manner as described above, using the laminate. This laminate is designated as Example 14.

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The image size of each liquid crystal display (30 and 40) was set to for example, 10.4 inches. The image contrast was evaluated according to the following methods, on the condition of the resonance being set to for example, 800 \times 600 dots.

With regard to the anti-reflection materials (10) obtained in Examples 1 to 14 and the comparative anti-reflection materials (10) obtained in Comparative Examples 1 to 6, anti-glarability, image glittering, reflectance, wear resistance, chemical resistance, critical surface tension, and stain resistance were measured and evaluated by the following methods.

Anti-glarability was measured on a transmission mode, with an optical comb width of 2 mm, using an image clarity measuring apparatus, ICM-1DP (JIS K7105), produced by Suga Testing Machine Corporation. The smaller the measured values are, the higher anti-glarability was. In this evaluation, the criteria was set as follows: less than 50%: \bigcirc , 50% or more and less than 70%: Δ , and 70% or more: X.

Image glittering was measured on a transmission mode, with an optical comb width of 0.125 mm, using the same apparatus as that in the anti-glarability measurement. The larger the measured values are, the less the image glittering was. In this evaluation, the criteria was set as follows: 10% or more: \bigcirc , 5% or more and less than 10%: Δ , and less than 5%: X.

With regard to reflectance, a regular reflection at 5 $^\circ$ was measured with a wave length ranging from 400 nm to 700 nm, using a spectrophotometer UV 3100 (produced by Shimadzu Seisakusho Corporation), and was shown as Y value wherein a visibility was corrected. The measurement was carried out after the non-measured face was completely black-finished using a black magic ink.

With regard to wear resistance, a steel wool #0000 produced by Nihon Steel Wool Corporation was set in a plated-paper wear resistance tester (produced by Kumagaya Riki Industry Corporation), the surface layer of the anti-reflection material was reciprocated at 50 times under 200 g of load, and subsequently, the change of the HAZE value, δH (according to the expression in the following) of the part was measured using a HAZE meter produced by Toyo Seiki Corporation. The larger the measured values are, the inferior wear resistance was. The measurement of the HAZE value was carried out using a simple substance of the anti-reflection material.

Change of HAZE value, δH =HAZE value after testing -HAZE value before testing

With regard to chemical resistance, the surface layer was rubbed using a cotton swab (produced by Johnson and Johnson, Inc.) containing isopropyl alcohol with 50 reciprocations, and subsequently, chemical resistance was evaluated with the criteria set as follows: a case where an extreme change such as peeling-off of the surface-roughened layer was observed: X, a case where no changes were observed: \bigcirc , and the intermediate case: Δ .

Critical surface tension was calculated as follows: A contact angle with respect to methylene iodide and water on the surface layer of the anti-reflection material was measured according to a Will Hermy method. The measured contact angle was substituted in the following expression described in "Base Science of Coating" (Yuji Harasaki, published by Maki Shoten), pp. 170 and 171. The critical